What is claimed is:

1. A process for producing an ethylene-vinyl alcohol copolymer resin, comprising

feeding an ethylene-vinyl alcohol copolymer into an extruder,

keeping the temperature of the melting resin in the extruder at 70 to 170℃,

adjusting an amount of water by supplying or removing water in the extruder, and

discharging the copolymer having a water content right after being discharged of 5 to 40 weight %.

2. The process according to claim 1, wherein at least one additive selected from the group consisting of a carboxylic acid, a boron compound, a phosphoric acid compound, an alkali metal salt, and an alkali earth metal salt is added in the extruder.

3. The process according to claim 2, wherein the carboxylic acid is at least one selected from the group consisting of acetic acid and lactic acid.

4. The process according to claim 2, wherein the additive is added in the form of an aqueous solution.

5. The process according to claim 1, wherein the water supplied to the extruder is a washing water for washing the ethylene-vinyl alcohol copolymer resin, the resin is washed by the washing water, the washing water is discharged in a liquid state from at least one place downstream from a washing water supply portion, and residue of saponification catalyst contained at the time of production of the resin is removed.

6. The process according to claim 5, wherein the residue of saponification catalyst contained in the ethylene-vinyl alcohol copolymer fed into the extruder is an alkali metal ion and the content of the ion is 0.1 to 5 weight % based on metal.

7. The process according to claim 5, wherein the content of alkali metal ion contained in the washed ethylene-vinyl alcohol copolymer is 0.05

weight % or less based on metal.

8. The process according to claim 5, wherein the washing water is an aqueous solution of acid having pKa of 3.5 or more at 25℃.

9. The process according to claim 1, wherein a method for removing water removes water in the form of liquid water or vapor water from a water-containing ethylene-vinyl alcohol copolymer resin, and the water is removed from at least one place of the extruder in at least one state selected from the group consisting of liquid water and vapor water.

10. The process according to claim 9, wherein the method for removing water uses at least one selected from the group consisting of a dewatering slit and a dewatering hole.

11. The process according to claim 1, comprising feeding a pellet of the resin into the extruder while keeping the entire water content of the pellet at the time of feeding the ethylene-vinyl alcohol copolymer into the extruder at 0.5 to 70 weight %, and the rate of a surface water of the pellet of the resin at less than 10 weight %.

12. The process according to claim 11, wherein the method for feeding the pellet is a volumetric feeding method in which the pellet is fed into the extruder by using a volumetric feeder.

13. The process according to claim 1, wherein the temperature of the melting resin inside the extruder is in the range of 90 to 140℃.

14. The process according to claim 1, wherein the water content of the resin composition right after being discharged is in the range of 15 to 30 weight %.

15. The process according to claim 1, wherein an ethylene content in the ethylene-vinyl alcohol copolymer is in the range of 3 to 70 mol%, and the saponification degree is in the range of 80 to 100 mol%.

16. A process for producing ethylene-vinyl alcohol copolymer resin

pellets, comprising producing an ethylene-vinyl alcohol copolymer resin by feeding an ethylene-vinyl alcohol copolymer into an extruder, keeping the melting temperature of the resin in the extruder at 70 to 170℃, adjusting an amount of water by supplying or removing water in the extruder, and discharging the copolymer having a water content right after being discharged is 5 to 40 weight %, and then cutting the discharged ethylene-vinyl alcohol copolymer resin after being discharged from the extruder and drying the cut product until the water content is 1 weight % or less.

17. The process according to claim 16, wherein the resin is cut in a molten state.

18. The process according to claim 16, wherein a method of cutting is at least one method selected from the group consisting of a hot-cut method and an under-water cut method.

19. An ethylene-vinyl alcohol copolymer resin pellet, produced by feeding an ethylene-vinyl alcohol copolymer into an extruder, keeping the melting temperature of the resin in the extruder at 70 to 170℃, adjusting an amount of water by supplying or removing water in the extruder, discharging the copolymer having a water content right after being discharged is 5 to 40 weight %, and then cutting the discharged ethylene-vinyl alcohol copolymer resin after being discharged from the extruder and drying the cut product until the water content is 1 weight % or less, wherein no spherocrystals are observed in the center of the cross section of the resin pellet when the cross section is observed by the use of polarization microscope with a magnification of 600.

20. An ethylene-vinyl alcohol copolymer resin pellet, produced by feeding an ethylene-vinyl alcohol copolymer into an extruder, keeping the melting temperature of the resin in the extruder at 70 to 170℃, adjusting an amount of water by supplying or removing water in the extruder, discharging the copolymer having a water content right after being discharged is 5 to 40 weight %, and then cutting the discharged ethylene-vinyl alcohol copolymer resin after being discharged from the extruder and drying the cut product until the water content is 1 weight % or less, wherein the angle of repose is 23° or less when the resin pellets are piled.

21. An ethylene-vinyl alcohol copolymer resin pellet, exhibiting no spherocrystals in a center of a cross section when observed by use of a polarization microscope with a magnification of 600.

22. The ethylene-vinyl alcohol copolymer resin pellet according to claim 21, wherein at least one additive selected from the group consisting of a carboxylic acid, a boron compound, a phosphoric acid compound, an alkali metal salt, and an alkali earth metal salt is added to the pellets.

23. The ethylene-vinyl alcohol copolymer resin pellet according to claim 22, wherein the carboxylic acid is at least one selected from the group consisting of acetic acid and lactic acid.

24. The ethylene-vinyl alcohol copolymer resin pellet according to claim 21, wherein the content of alkali metal ion contained in the pellets is 0.05 weight % or less based on metal.

25. The ethylene-vinyl alcohol copolymer resin pellet according to claim 21, wherein an ethylene content in the ethylene-vinyl alcohol copolymer is in the range of 3 to 70 mol%, and the saponification degree is in the range of 80 to 100 mol%.

26. The ethylene-vinyl alcohol copolymer resin pellet according to claim 21, wherein the water content of the pellets is 1 weight % or less.

27. An ethylene-vinyl alcohol copolymer resin pellet, exhibiting an angle of repose of 23° or less when piled.

28. The ethylene-vinyl alcohol copolymer resin pellet according to claim 27, wherein at least one additive selected from the group consisting of a carboxylic acid, a boron compound, a phosphoric acid compound, an alkali metal salt, and an alkali earth metal salt is added to the pellets.

29. The ethylene-vinyl alcohol copolymer resin pellet according to claim 28, wherein the carboxylic acid is at least one selected from the group consisting of acetic acid and lactic acid.

30. The ethylene-vinyl alcohol copolymer resin pellet according to claim 27, wherein the content of alkali metal ion contained in the pellets is 0.05 weight % or less based on metal.

31. The ethylene-vinyl alcohol copolymer resin pellet according to claim 27, wherein an ethylene content in the ethylene-vinyl alcohol copolymer is in the range of 3 to 70 mol%, and the saponification degree is in the range of 80 to 100 mol%.

32. The ethylene-vinyl alcohol copolymer resin pellet according to claim 27, wherein the water content of the pellets is 1 weight % or less.

ABSTRACT

A process for producing an ethylene-vinyl alcohol copolymer resin, including feeding EVOH into an extruder, keeping the temperature of the melting resin in the extruder at 70 to 170℃, adjusting the amount of water in the extruder so that the water content right after being discharged from the extruder is 5 to 40 weight %, and extruding out the EVOH resin. The extruded EVOH resin is cut into EVOH pellets. Thereby, it is possible to obtain resin pellets in which no spherocrystals are observed in the center of the cross section of the resin when the cross section is observed by the use of a polarization microscope, or no lubricant is contained in the resin pellets, and the angle of repose is 23 ° or less when the resin pellets are laminated. Thus, it is possible to provide an ethylene-vinyl alcohol copolymer (EVOH) resin pellet having a reduced discharging load to the environment and capable of being fed into an extruder smoothly without being blocked, extruding stability, and thermal stability (long-run property).

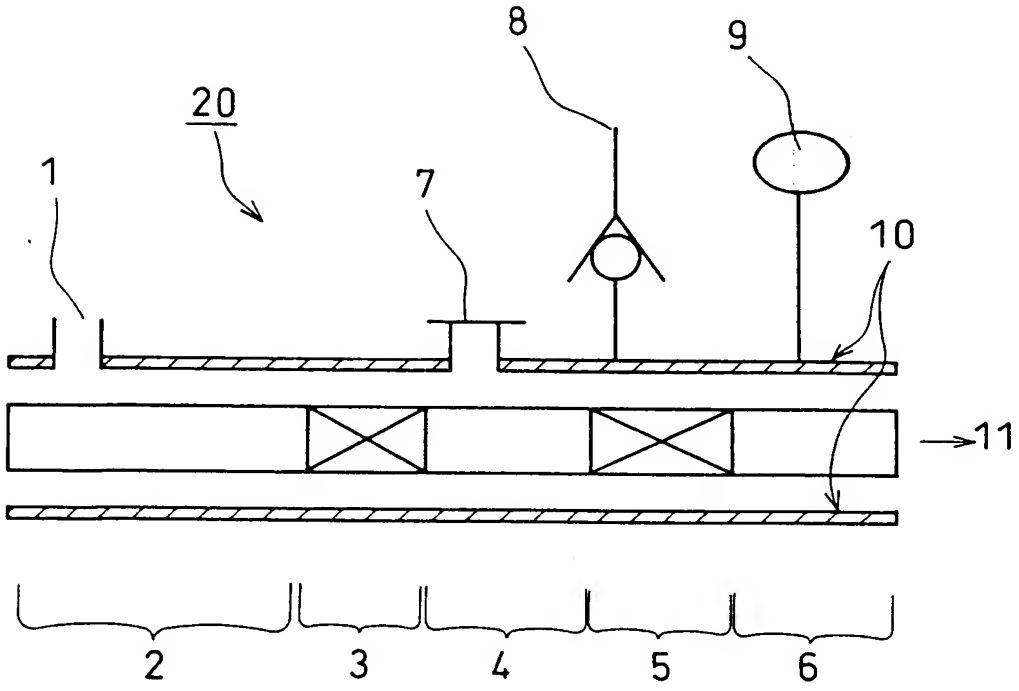

FIG. 1

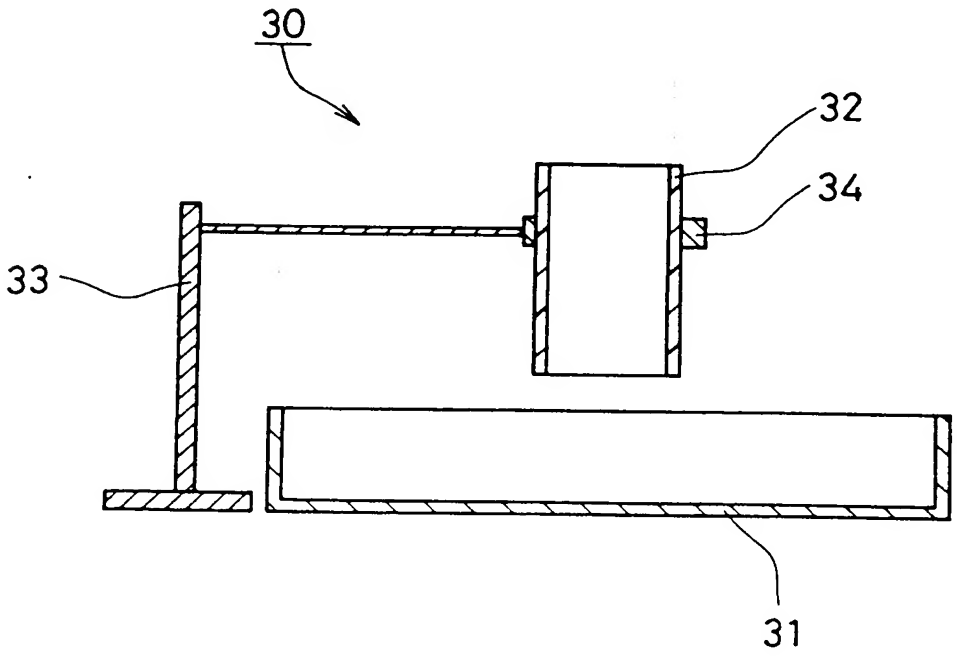

FIG. 2

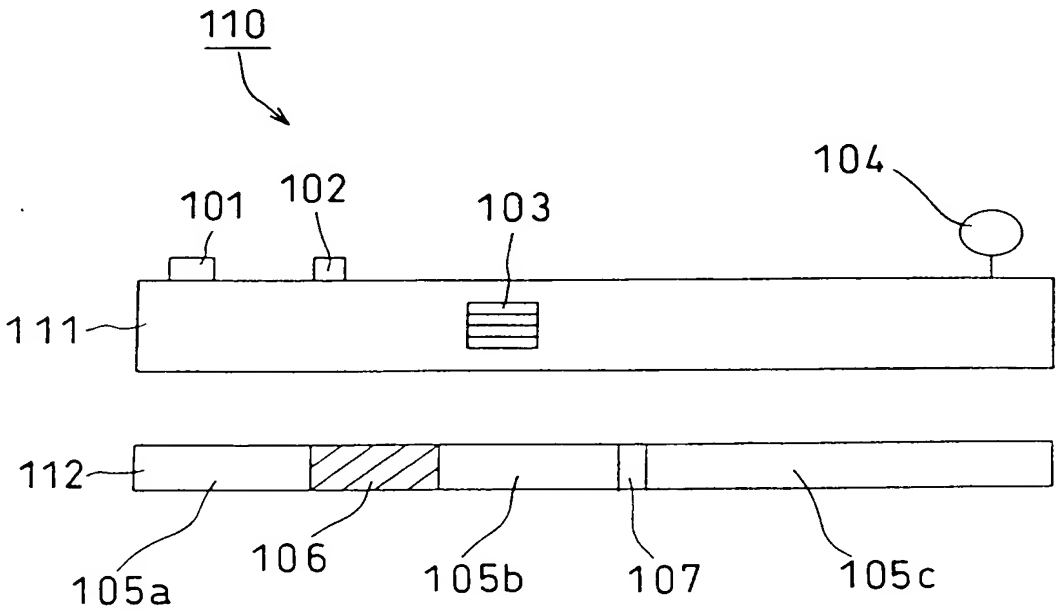

FIG. 3

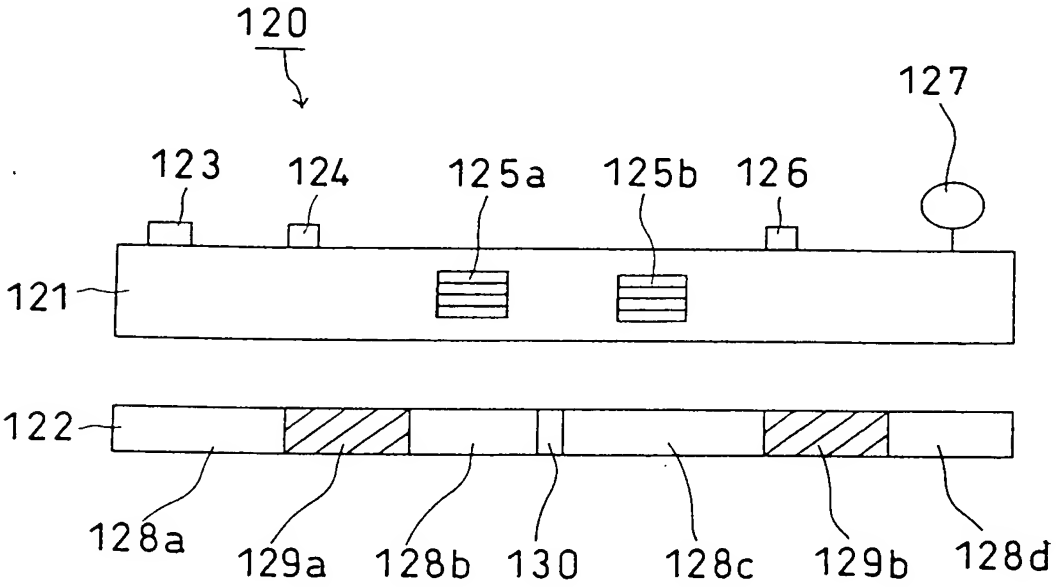

FIG. 4

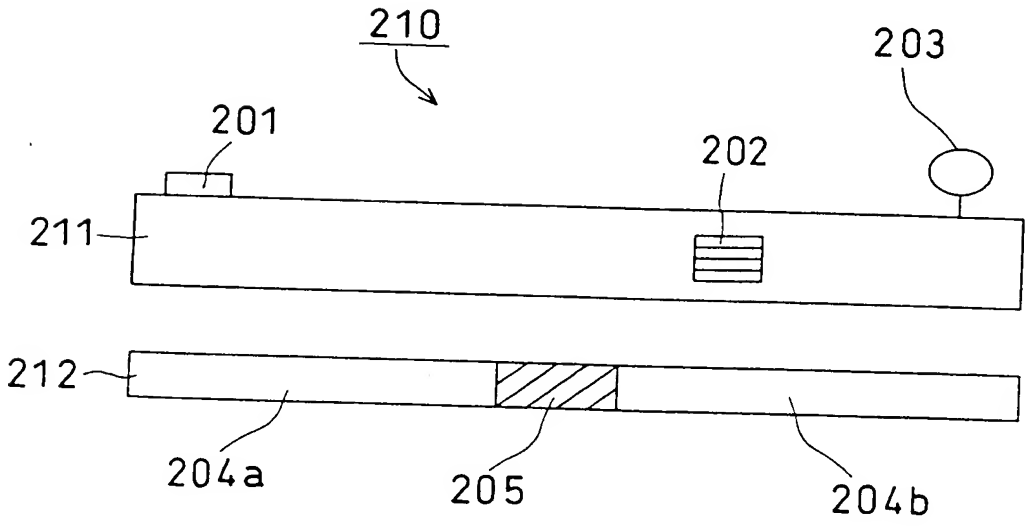

FIG. 5

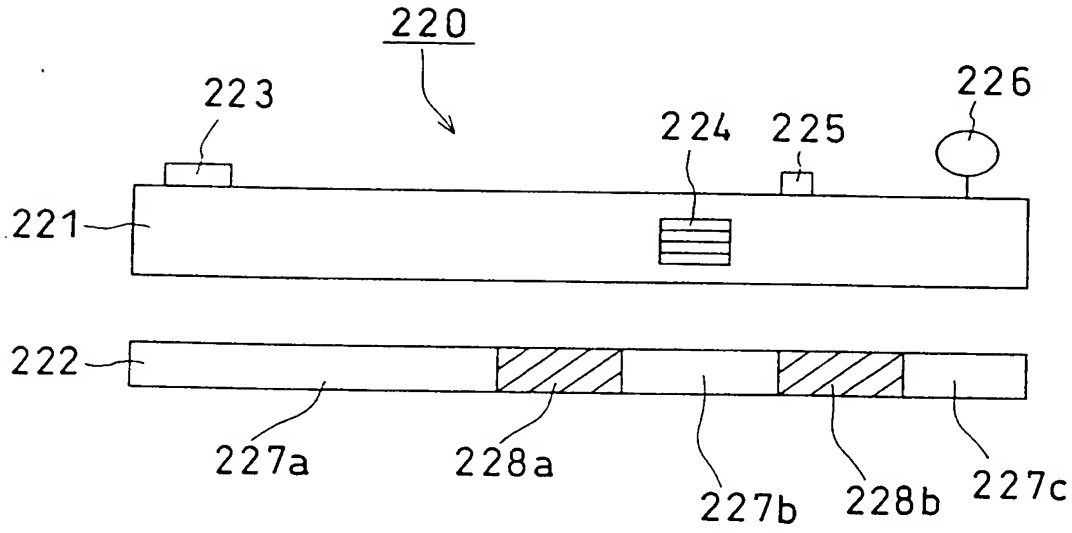

FIG. 6

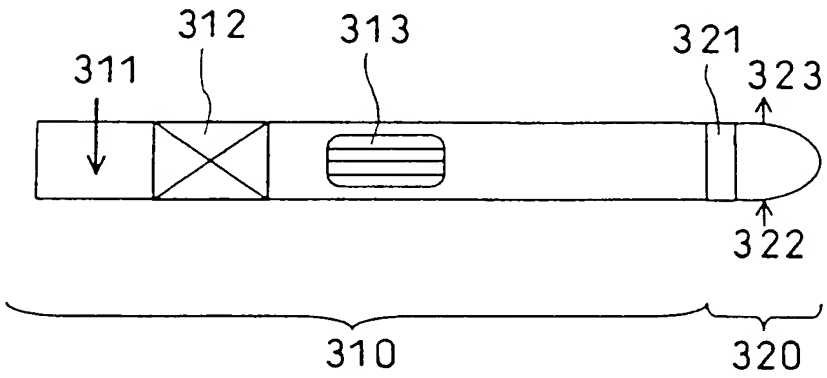

FIG. 7

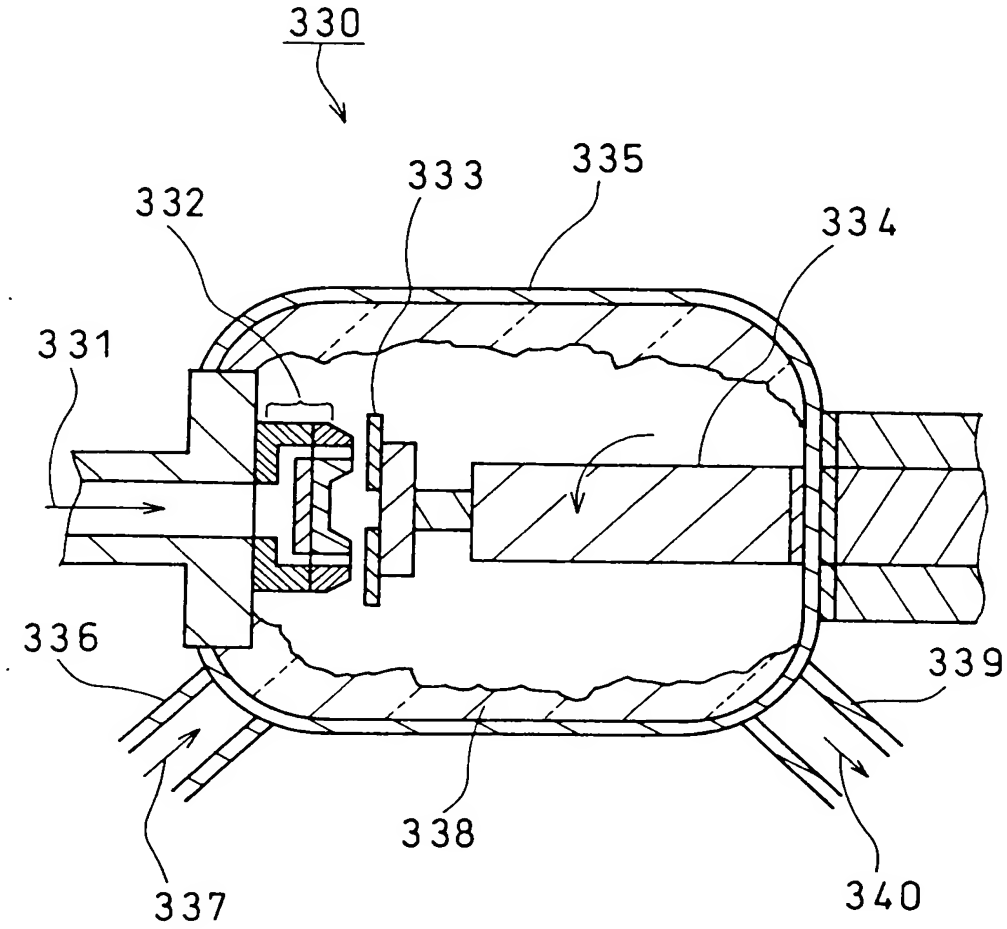

FIG. 8

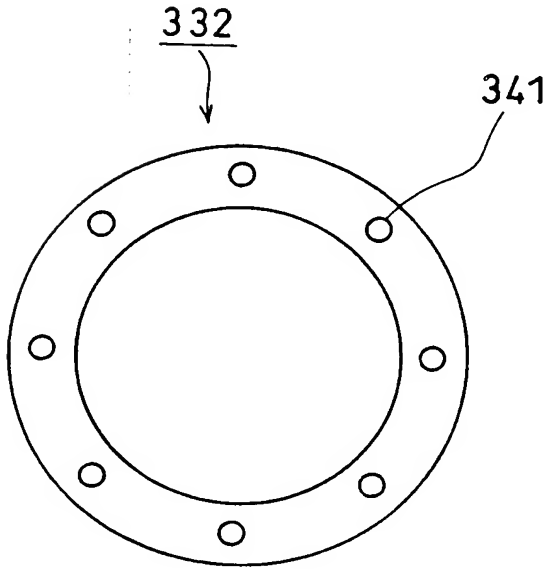

FIG. 9

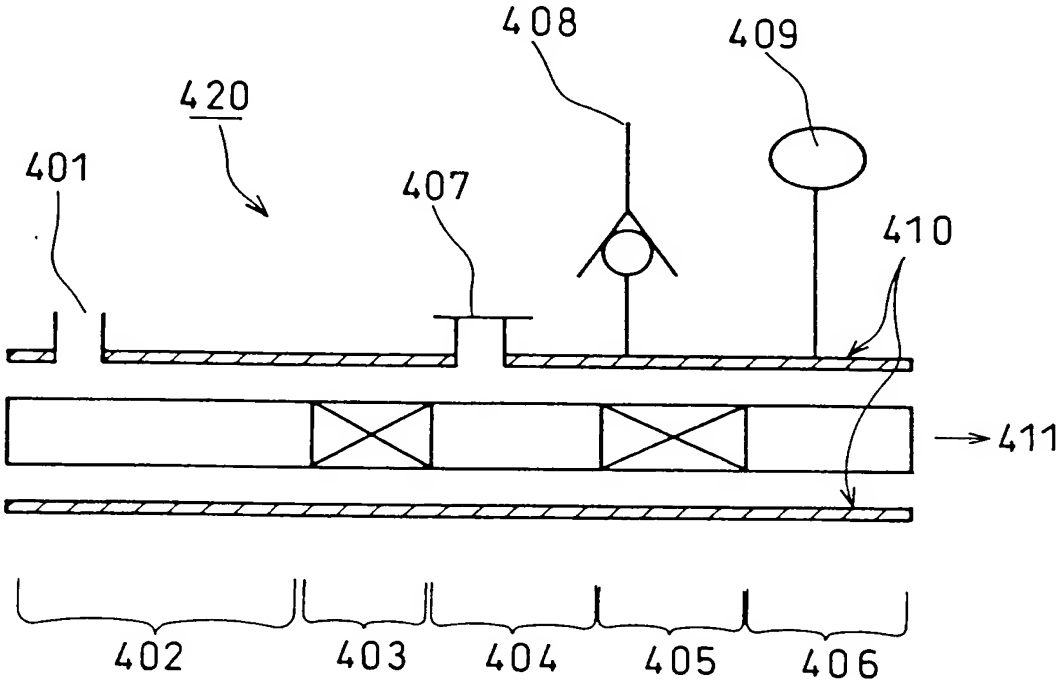

FIG. 10

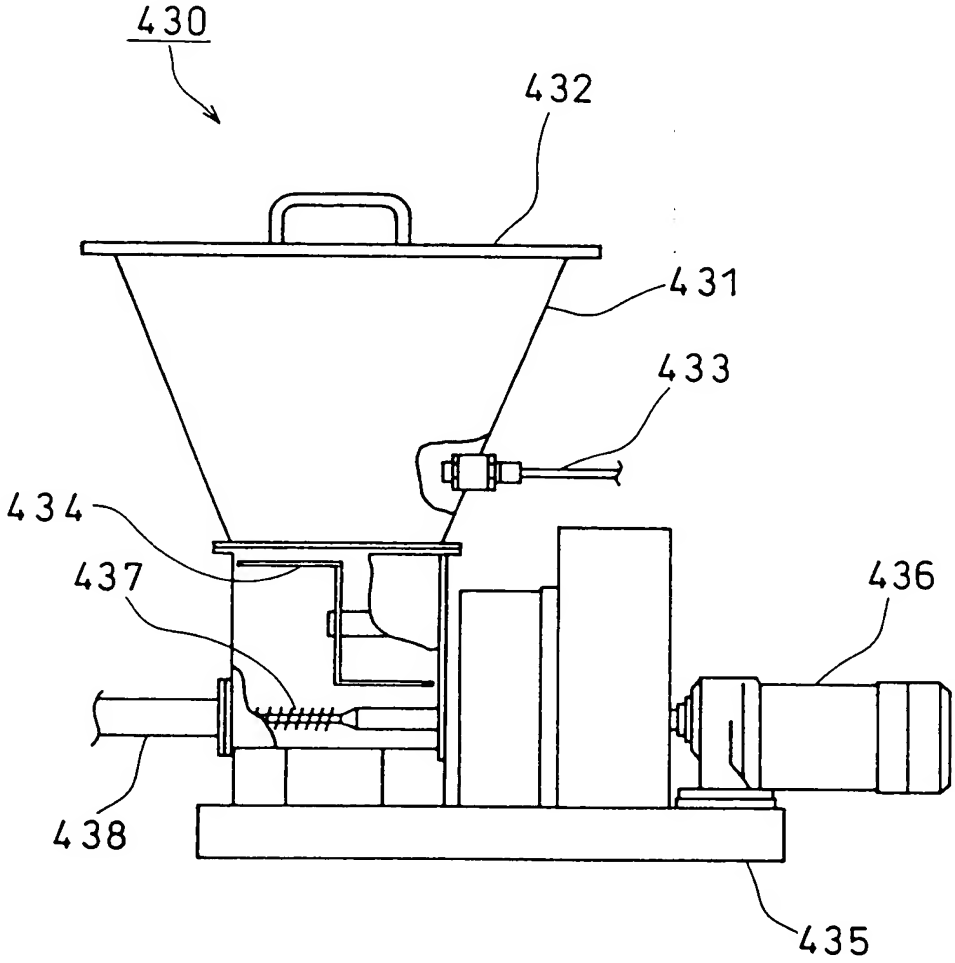

FIG. 11